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Vulnerability Assessment of Memphis/Shelby County Emergency Shelters

By

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Technical ABSTRACT

According to the American Red Cross, the number of displaced people in Memphis/Shelby County could total over 103,000 following a magnitude 7.6 earthquake occurring in the New Madrid seismic zone. As was the case in Kobe, Japan following the disastrous earthquake that shook that city in 1995, shelter overcrowding could be complicated by the destruction of many of the very structures that have been designated for emergency shelters. In addition, violent aftershocks could place shelter occupants at risk if the shelter is seismically vulnerable, either due to inadequate lateral force resisting systems or a poor soil foundation material. This research was to conduct structural and geotechnical surveys of the designated emergency shelters for Memphis/Shelby County using a modified version of the Applied Technology Council's (ATC) methodology outlined in the Federal Emergency Management Agency's "Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook" commonly referred as ATC-21 or "Rapid Screening Procedure." This modified procedure was the same used in previous studies of critical facilities in Memphis/Shelby County.

The proposed research focused on the following tasks: 1) identification and background data acquisition for preparing a database of the target existing emergency shelters, 2) site visits to document current conditions of the designated facility, 3) preliminary vulnerability assessment of each facility, 4) mapping of these facility locations in a geographic information system (GIS), and 5) transfer of research results to appropriate government agencies and private sector firms.

The results of this research can be used to supplement regional earthquake plans in such ways as to reduce the risk of casualty from earthquakes and their aftershocks in the study area, to mitigate the real losses in

the total number of emergency shelters, to estimate the cost to repair or replace such facilities, to aid in the selection of additional shelter sites, and to plan for response and recovery actions.

Non-Technical ABSTRACT

According to the American Red Cross, the number of displaced people in Memphis/Shelby County could total over 103,000 following a magnitude 7.6 earthquake occurring in the New Madrid seismic zone. As in 1995 Kobe, Japan shelter overcrowding could be complicated by the destruction of structures that have been designated for emergency shelters. In addition, violent aftershocks could place shelter occupants at risk if the shelter is seismically vulnerable. This research was to conduct surveys of the designated emergency using a "Rapid Screening Procedure."

Results of this research will provide data to reduce the risk of casualty from earthquakes and their aftershocks in the study area, to mitigate the real losses in the total number of emergency shelters, and to plan for response and recovery actions.